# US Army Medical Research and Materiel Command

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## Method for Self-Detection of Pupillary Response

This invention is a method for the self-detection of an abnormal pupillary response. Normal pupils respond consensually, which means the dilation or constriction of one pupil when light changes causes the other pupil to respond in the same way. Exposure to organophosphates in nerve gases and some pesticides can cause abnormal pupillary responses. One of the first symptoms of organophosphate exposure is miosis, which is the constriction of the pupil. It begins within seconds of exposure and may last for hours, weeks, or even months. The effects include dim or blurred vision, inadequacies of depth perception and diminished visual acuity.

Humans may be exposed to organophosphates in military situations, during terrorist attacks, or accidentally while using them in laboratory or agricultural settings. To minimize harm, it is important to seek treatment as soon as possible after exposure. The invention provides a means of rapidly self-detecting miosis whenever organophosphate exposure is suspect.

The method uses a portable ocular device about the size of a cigarette pack. It consists of an attached eyeglass cup with a glass aperture on which the pupil can be viewed, a built-in activation switch, silver oxide disc battery, and an LED light source. When the cup is placed over one eye, the pupil's consensual response (or, in the case of miosis, non-response) to changes in light displayed to the non-covered eye can be observed through the aperture. For example, if the cup is placed over the left eye and the right eye covered with the hand, the left pupil should consensually dilate to let in more light. The user observes whether or not the left pupil dilates by observing its image on the glass aperture. Conversely when the right hand is removed the right pupil will constrict, and the left pupil should constrict consensually.

### Features and advantages:

- Easy, quick means of self-detection of exposure to organophosphates
- Uses LED light source, silver oxide disc battery and attached eye cup with built-in activation switch
- Small, highly portable device
- Withstands wear and tear of handling by military personnel and medical caregivers
- Packaged in new Army green plastic casings and belt fastenable carrying pouch

### Patent Status

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